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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/534,024	12/05/2005	Vassili Timofeevitch Mikhaltsevitch	WRA0012-US	1392
28970	7590	08/09/2006	EXAMINER	
PILLSBURY WINTHROP SHAW PITTMAN LLP			VAUGHN, MEGANN E	
1650 TYSONS BOULEVARD			ART UNIT	
MCLEAN, VA 22102			PAPER NUMBER	
			2859	

DATE MAILED: 08/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/534,024	<b>Applicant(s)</b> MIKHALTSEVITCH ET AL.	
	<b>Examiner</b> Megann E. Vaughn	<b>Art Unit</b> 2859	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 May 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 4 and 6 is/are rejected.
- 7) ☒ Claim(s) 2 and 5 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 May 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>5/6/2005</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: **Figure 1A and Figure 1B described on page 7 of the Specification.** Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Specification*

2. The disclosure is objected to because of the following informalities:
- Page 11, line 14, "fifth" should be, **fourth**,
  - Page 12, line 22, "sixth" should be, **fifth**.
- Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite in that it fails to point out what is included or excluded by the claim language. This claim is an omnibus type claim.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 3, and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Withers et al (US 5276398) in view of Sydney et al (US 5457385).

Regarding claim 1, Withers et al discloses in figure 1, a coil assembly for a superconducting probe coil to be used in a system for detecting a resonance signal in a substance (Summary), each section consisting of a spiral coil arrangement having a spiral coil (22) radially convolving outwardly from and about a centre point of the coil section (see figures 1 and 11).

Regarding claim 3, Withers et al discloses in figure 11, that the winding of the coil is arranged so that the coil pitch varies along the radius of the coil (see figure 11), it seems as if the sections between coils are larger as you approach the outer capacitive electrode when closely examining figure 11.

Regarding claim 4, Withers et al discloses in figure 1, that the coil winding has a transverse extent that varies along the radius to maintain a constant gap between the windings (see figure 1), Withers et al discloses finger electrodes (28), for example, to be placed between consecutive windings, therefore the gap between the windings must be constant since the length of the finger electrodes are assumed to be the same size when examining figure 1.

Withers et al does not disclose specifically that the probe coil assembly is used for detecting nuclear quadrupole resonance, wherein the coil assembly comprising a pair of opposed coil sections.

Sydney et al discloses in figure 1, a NQR apparatus comprising multiple opposing detecting coils (1a, 1b, 2a, 2b, etc), wherein the detecting coils are spiral coils (see figures 8 and 9). Therefore it would have been obvious to a person having ordinary skill in the art at the time that the invention was made to use the superconducting probe coil disclosed by Withers et al in the multiple coil NQR system disclosed by Sydney et al in order to measure the nuclear quadrupole resonance as taught by Sydney et al while using a higher-Q (due to the superconductive material) detection coil assembly as taught by Withers et al (column 2, lines 55-57), which will increase the over all resolution of the combined system.

***Allowable Subject Matter***

6. Claims 2 and 5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 2 is allowable over the prior art of record because the prior art of record does not teach or disclose a coil assembly for a probe coil to be used in a system for detecting a nuclear quadrupole resonance signal in a substance, the spiral coil arrangement is configured in a saddle shape, the saddle shape having a central portion and a pair of coextending outer portions, the central portions of the sections being disposed in opposing spaced apart relationship about a common axis coincident with the centre points of each coil section, in combination with the remaining limitations of the claims.

Claim 5 is allowable over the prior art of record because the prior art of record does not teach or disclose a coil assembly for a probe coil to be used in a system for detecting a nuclear quadrupole resonance signal in a substance, the coil winding varies in accordance with a logarithmic winding scheme defined by the expression:

$$r_{n+1} / r_n = \ln(1 + a(n+1)) / \ln(1 + an)$$

where n is the number of spiral turns, a is a parameter used for optimization,  $r_{n+1}$  and  $r_n$  are distances from the centre of the spiral to the  $(n+1)^{th}$  and the  $n^{th}$  turns, in combination with the remaining limitations of the claims.

### ***Conclusion***

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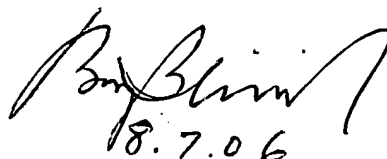
7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Anderson (US 6054855) discloses in figure 7A, a pair of HTS spiral coils where their centre points appear to share the same axis, Wong et al (US 2003/0062896) discloses a NMR probe with a rectangular spiral structure, and Ikeda (US 4743852) also discloses a spiral coil for an NMR probe.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Megann E. Vaughn whose telephone number is 571-272-8927. The examiner can normally be reached on 8 am- 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on 571-272-2245. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MEV  
Patent Examiner  
8/7/2006



18.7.06

**BRIJ SHRIVASTAV**  
**PRIMARY EXAMINER**